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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/584,453	06/22/2006	Shinichi Inoue	1752-0184PUS1	4155
2292 7590 07/08/2009 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
WOOD, JARED M				
ART UNIT		PAPER NUMBER		
1793				
NOTIFICATION DATE		DELIVERY MODE		
07/08/2009		ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/584,453

Applicant(s)

INOUE ET AL.

Examiner

JARED WOOD

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,4-12 and 17-19 is/are allowed.
- 6) ☒ Claim(s) 13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by KR 2001091498 (Yu, text of machine translation is used for applicants convenience).

Yu teaches a process for coating an inorganic oxide with TiO_2 to prepare a photocatalyst where a silica/alumina carrier particle is dispersed in a solution of TiCl_4 or $\text{Ti}(\text{SO}_4)_2$ (pg. 3, ¶ 3). A precipitation agent such as ammonium bicarbonate or NaOH adjusts the pH of the solution in order to precipitate titanium hydroxide onto the surface of the inorganic oxide particle (pg. 3, ¶ 3). The particles are then calcined for 1-10 hours at a temperature between 300°C and 700°C to convert the titanium hydroxide to TiO_2 (pg. 3, ¶ 4).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over KR 2001091498 (Yu) in view of US 4,248,852 (Wakabayashi et al.).

The limitations of claim 13 are met as previously discussed. However, Yu does not teach producing the inorganic oxide particles via a pH swing technique to form a dispersion.

Wakabayashi teaches a process which forms a needle-shaped “pseudo-boehmite” structured alumina catalyst/catalyst carrier (column 1, line 20 and figure 1), formed using a pH swing operation. Wakabayashi’s alumina catalyst carrier has a specific surface area of 300 m²/g or more (column 6, line 14).

It would have been obvious to use the alumina formed by the process of Wakabayashi as the inorganic oxide in place of the silica/alumina in the process and catalyst taught by Yu in order to achieve a desirably high specific surface area in the final layered catalyst and improve its mechanical strength and catalytic activity (col. 1, ln. 11-18).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over KR 2001091498 (Yu) in view of US 5,633,081 (Clough et al.).

The limitations of claim 13 are met as previously discussed. However, Yu does not teach the existence of particle growth inhibitor in his process solution.

Clough teaches a process for coating a substrate with an oxide from a chloride solution including the use of a grain (particle) growth inhibitor to impart beneficial properties into the oxide layer. Clough teaches that suitable inhibitors include at least one of potassium, calcium, magnesium, and silicon (col. 10, ln. 19-32).

It would have been obvious to one of ordinary skill in the art at the time of invention to include a grain growth inhibitor according to the teachings of Clough in the process of Yu in order to impart beneficial properties, such as a uniform coating morphology and greater overall stability, into Yu's TiO₂ coating (col. 10, ln. 19-32).

Allowable Subject Matter

Claims 1, 2, 4-12 and 17-19 are allowed.

The following is an examiner's statement of reasons for allowance: No prior art could be found that teaches or suggests a process for coating titanium oxide onto an inorganic oxide

particle which meets the limitations of claim 1 (essentially, an amorphous TiO_2 coating, i.e. does not register on analysis with XRD).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments, see pgs. 7-9, filed 03/18/2009, with respect to the teachings of Ryu et al. have been fully considered and are persuasive. The rejection of claims 1, 2, and 4-19 has been withdrawn and a new grounds of rejection has been issued for claims 13-16. As the attorney pointed out, the Ryu reference originally relied upon does not teach an electrostatic attraction between the titania particles and the silica particles and therefore does not meet all the limitations of claim 1 singly or in combination. As to claim 13, the Ryu reference teaches adding titania particles to the silica hydrosol and includes no teaching of forming the titania particles from a solution comprising TiCl_4 , $\text{Ti}(\text{SO}_4)_2$, or TiOSO_4 .

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JARED WOOD whose telephone number is (571)270-5911. The examiner can normally be reached on Monday - Friday, 7:30 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JARED WOOD/
Examiner, Art Unit 1793

/J.A. LORENZO/
Supervisory Patent Examiner, Art Unit
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